

COMPONENTS: (1) Tripotassium phosphate; K_3PO_4 ; [7778-53-2] (2) Ammonia; NH_3 : [7664-41-7] (3) Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Jänecke, E. Z. Phys. Chem. <u>1927</u> , 127, 71-92.																																																																																											
VARIABLES: Composition and temperature.	PREPARED BY: J. Eysseltová																																																																																											
EXPERIMENTAL VALUES: A miscibility gap was found in the liquid phase of the $K_3PO_4-NH_3-H_2O$ system. Part 1. The isothermal binodal curve of the miscibility gap at 0°C. <table border="1" data-bbox="396 574 1172 932"> <thead> <tr> <th>H_2O conc.^a</th> <th>NH_3 conc.^a</th> <th colspan="2">K_3PO_4^b</th> <th colspan="2">NH_3^b</th> <th>H_2O^b mass%</th> </tr> <tr> <th></th> <th></th> <th>mass%</th> <th>mol/kg</th> <th>mass%</th> <th>mol/kg</th> <th></th> </tr> </thead> <tbody> <tr><td>238</td><td>13.2</td><td>25.68</td><td>0.51</td><td>3.90</td><td>0.96</td><td>70.41</td></tr> <tr><td>258</td><td>15.9</td><td>23.49</td><td>0.43</td><td>4.44</td><td>1.01</td><td>72.07</td></tr> <tr><td>257</td><td>20.9</td><td>22.16</td><td>0.41</td><td>5.85</td><td>1.34</td><td>71.99</td></tr> <tr><td>276</td><td>27.6</td><td>19.26</td><td>0.33</td><td>7.34</td><td>1.56</td><td>73.40</td></tr> <tr><td>294</td><td>36.6</td><td>16.09</td><td>0.26</td><td>9.29</td><td>1.86</td><td>74.62</td></tr> <tr><td>307</td><td>41.6</td><td>14.35</td><td>0.22</td><td>10.22</td><td>1.96</td><td>75.43</td></tr> <tr><td>320</td><td>47.0</td><td>12.62</td><td>0.18</td><td>11.19</td><td>2.06</td><td>76.19</td></tr> <tr><td>329</td><td>53.9</td><td>10.74</td><td>0.15</td><td>12.56</td><td>2.25</td><td>76.69</td></tr> <tr><td>349</td><td>74.2</td><td>5.75</td><td>0.08</td><td>16.52</td><td>2.78</td><td>77.73</td></tr> <tr><td>285</td><td>90.6</td><td>2.44</td><td>0.04</td><td>23.53</td><td>4.86</td><td>74.02</td></tr> <tr><td>235</td><td>91.6</td><td>2.51</td><td>0.05</td><td>27.34</td><td>6.84</td><td>70.15</td></tr> </tbody> </table> <p data-bbox="348 946 996 987">^aThe concentration unit is: g/100 g of ($K_3PO_4 + NH_3$).</p> <p data-bbox="348 993 911 1028">^bThese values were calculated by the compiler.</p>		H_2O conc. ^a	NH_3 conc. ^a	K_3PO_4 ^b		NH_3 ^b		H_2O ^b mass%			mass%	mol/kg	mass%	mol/kg		238	13.2	25.68	0.51	3.90	0.96	70.41	258	15.9	23.49	0.43	4.44	1.01	72.07	257	20.9	22.16	0.41	5.85	1.34	71.99	276	27.6	19.26	0.33	7.34	1.56	73.40	294	36.6	16.09	0.26	9.29	1.86	74.62	307	41.6	14.35	0.22	10.22	1.96	75.43	320	47.0	12.62	0.18	11.19	2.06	76.19	329	53.9	10.74	0.15	12.56	2.25	76.69	349	74.2	5.75	0.08	16.52	2.78	77.73	285	90.6	2.44	0.04	23.53	4.86	74.02	235	91.6	2.51	0.05	27.34	6.84	70.15
H_2O conc. ^a	NH_3 conc. ^a	K_3PO_4 ^b		NH_3 ^b		H_2O ^b mass%																																																																																						
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METHOD/APPARATUS/PROCEDURE: No information is given.	SOURCE AND PURITY OF MATERIALS: No information is given. ESTIMATED ERROR: No information is given. REFERENCES:																																																																																											

COMPONENTS:

- (1) Tripotassium phosphate; K_3PO_4 ; [7778-53-2]
 (2) Ammonia; NH_3 ; [7664-41-7]
 (3) Water; H_2O ; [7732-18-5]

ORIGINAL MEASUREMENTS:

Jänecke, E.
Z. Phys. Chem. 1927, 127, 71-92.

EXPERIMENTAL VALUES cont'd:

Part 2. Composition of solutions existing in equilibrium with $K_3PO_4 \cdot 8H_2O$.

$t/^\circ C.$	layer	K_3PO_4			NH_3			H_2O	
		mass%	conc ^a	mol/kg ^b	mass%	conc ^a	mol/kg ^b	mass%	conc ^a
0	upper	3.2	13.85	0.04	19.9	86.15	3.52	76.9	332.6
	lower	39.1	95.7	1.27	1.8	4.3	0.71	59.1	144.7
15	upper	2.5	9.0	0.05	25.5	91.0	5.83	72.0	257.0
	lower	45.5	94.8	1.99	2.5	5.2	1.36	52.0	108.0
25	upper	4.2	14.6	0.09	24.5	85.4	6.52	71.3	232.0
	lower	50.0	97.3	2.47	1.4	2.7	0.86	48.6	95.0

^aThe concentration unit is: g/100 g of ($K_3PO_4 + NH_3$).

^bThe mol/kg H_2O values were calculated by the compiler.

Part 3. Temperatures of the miscibility gap in some solutions of the $K_3PO_4-NH_3-H_2O$ system.

gram	K_3PO_4		gram	NH_3		gram	H_2O		$t/^\circ C.$ ^b
	mass% ^a	mol/kg ^a		mass% ^a	mol/kg ^a		mass% ^a	mol/kg ^a	
93.55	35.57	1.03	6.45	2.45	0.88	183	61.98	0	
89.5	29.98	0.71	10.5	3.52	1.04	198.5	66.50	0	
84.3	26.55	0.58	15.7	4.94	1.34	217.5	68.50	0.3	
78.5	23.21	0.46	21.5	6.36	1.57	238.2	70.43	6.9	
66.5	19.76	0.39	33.2	9.82	2.42	238.1	70.42	46.05	
56.3	15.50	0.28	43.5	11.94	2.66	264.4	72.56	45.75	
42.8	11.08	0.18	56.1	14.16	2.81	296.2	74.76	39.6	
25.0	5.77	0.08	75.0	17.32	3.06	333	76.90	14.2	
93.6	37.71	1.20	6.4	2.58	1.02	148.2	59.71	37.7	
91.0	37.07	1.20	9.0	3.67	1.48	145.5	59.27	57.2	
85.0	32.32	0.93	15.0	5.70	2.06	163	61.98	70.2	
78.5	27.84	0.72	21.5	7.62	2.46	182	64.54	69.4	
71.1	23.66	0.56	28.9	9.62	2.82	200.5	66.72	52.4	
60.5	18.85	0.40	39.5	12.30	3.28	221	68.85	44.6	
50.8	14.74	0.28	49.2	14.28	3.43	244.6	70.98	35.95	
29.2	7.10	0.11	70.8	17.20	3.25	311.5	75.70	13	

^aThese values were calculated by the compiler.

^bWhen the temperature is raised, this is the temperature at which two layers are first observed.

COMPONENTS:			ORIGINAL MEASUREMENTS:				
(1) Tripotassium phosphate; K_3PO_4 ; [7778-53-2] (2) Dipotassium sulfate; K_2SO_4 ; [10233-01-9] (3) Water; H_2O ; [7732-18-5]			Rustamov, K.A.; Rza-Zade, P.F.; Abduragimova, R.A. <i>Issled. Obl. Neorg. Fiz. Khim.</i> 1971, 167-9. (Proceedings of the Institute of Inorganic and Physical Chemistry, Academy of Sciences of the Adzerbeidzhan SSR)				
VARIABLES:			PREPARED BY:				
Composition at 70°C.			J. Eysseltová				
EXPERIMENTAL VALUES:							
Solubility isotherm for the K_3PO_4 - K_2SO_4 - H_2O system at 70°C.							
P_2O_5	K_3PO_4	SO_3	K_2SO_4	H_2O	solid _b phase		
mass%	mass%	mol/kg ^a	mass%	mass%	mol/kg ^a	mass%	
-----	-----	-----	7.5906	16.5095	1.13	83.4905	A
0.6889	2.0599	0.11	6.9682	15.1558	1.05	82.7843	"
1.3413	4.0042	0.22	6.1820	13.4459	0.93	82.5499	A + B
1.4378	4.2932	0.24	5.4722	11.9020	0.81	83.8048	B
2.0000	5.9718	0.33	5.5432	9.8815	0.67	84.1467	"
3.5883	10.7143	0.61	3.2616	7.0941	0.49	82.1916	"
4.6607	13.9164	0.81	2.7395	5.9584	0.42	80.1252	"
6.8621	20.4895	1.27	1.6339	3.5537	0.26	75.9568	"
8.1070	24.2020	1.56	1.3371	2.9081	0.22	72.8899	"
8.8433	26.4033	1.71	0.5414	1.1835	0.09	72.4112	"
10.7585	32.1239	2.29	0.8320	1.8098	0.15	66.0663	B + C
11.9900	35.8011	2.65	0.2833	0.6163	0.05	63.5826	C
13.7434	41.0365	3.30	0.1879	0.4087	0.04	58.5548	"
17.3498	51.8049	5.08	0.0926	0.2014	0.02	47.9937	"
21.4349	64.0026	8.37	-----	-----	-----	35.9974	"
^a The mol/kg H_2O values were calculated by the compiler.							
^b The solid phases are: A = K_2SO_4 ; B = $K_2SO_4 \cdot K_3PO_4 \cdot 9H_2O$; C = $K_3PO_4 \cdot 7H_2O$.							
AUXILIARY INFORMATION							
METHOD/APPARATUS/PROCEDURE:				SOURCE AND PURITY OF MATERIALS:			
The potassium phosphate was added to saturated solutions of potassium sulfate and the mixtures were equilibrated in vessels of Mo-glass placed in a water thermostat. Equilibrium was checked by repeated experiments. The P_2O_5 and SO_3 contents were determined photocolometrically. The solid phases were analyzed only occasionally.				Pure" and "chemically pure" K_2SO_4 and K_3PO_4 were used.			
				ESTIMATED ERROR:			
				No details are given.			
				REFERENCES:			

COMPONENTS:			ORIGINAL MEASUREMENTS:				
(1) Tripotassium phosphate; K_3PO_4 ; [7778-53-2]			Protsenko, P.I.; Ivleva, T.I.; Rubleva, V.V.; Berdyukova, V.A.; Edush, T.V.				
(2) Potassium nitrite; KNO_2 ; [7758-09-0]			Zh. Prikl. Khim. (Leningrad) 1975, 48, 1055-9.				
(3) Water; H_2O ; [7732-18-5]							
VARIABLES:			PREPARED BY:				
Composition at 25°C.			J. Eysseltová				
EXPERIMENTAL VALUES: Solubility in the K_3PO_4 - KNO_2 - H_2O system at 25°C.							
K_3PO_4 ^a		KNO_2 ^a		H_2O		solid phase	
mass%	concn ^b	mol/kg ^b	mass%	concn ^a	mol/kg ^b	mass%	
50.71	87.24	4.85	0.00	0.00	0.00	49.29	$K_3PO_4 \cdot 7H_2O$
49.50	86.41	4.80	1.93	8.40	0.47	48.57	"
43.50	82.28	4.57	11.68	55.10	3.06	44.82	"
43.39	83.58	4.64	12.59	60.48	3.36	44.02	"
40.65	80.86	4.49	16.72	82.92	4.61	42.63	"
38.70	80.62	4.48	20.60	107.02	5.96	40.70	"
36.39	83.15	4.62	24.67	134.00	7.44	38.94	"
33.43	76.39	4.24	29.46	167.87	9.33	37.11	"
31.19	73.57	4.09	32.87	193.41	10.75	35.94	$K_3PO_4 \cdot 7H_2O + KNO_2$
31.09	73.23	4.07	32.90	192.77	10.71	36.01	"
31.08	73.28	4.07	32.96	194.11	10.78	35.96	"
31.08	73.34	4.07	33.00	194.43	10.80	35.92	"
28.62	69.07	3.84	36.25	218.23	12.12	35.13	KNO_2
24.93	62.00	3.44	40.99	254.37	14.13	34.08	" ₂
20.37	52.69	2.93	46.85	303.97	16.89	32.78	"
16.32	44.70	2.48	51.20	333.68	18.54	32.48	"
12.63	35.03	1.95	56.81	393.15	21.84	30.56	"
8.10	24.26	1.35	63.55	474.09	26.34	28.35	"
4.98	15.81	0.88	68.32	541.08	30.06	26.70	"
-----	-----	-----	75.92	666.81	37.05	24.08	"
^a The concentration unit is: mol/1000 mol water.							
^b The mol/kg H_2O values were calculated by the compiler.							
AUXILIARY INFORMATION							
METHOD/APPARATUS/PROCEDURE:				SOURCE AND PURITY OF MATERIALS:			
The isothermal method was used. Ten to twelve hours were allowed for equilibration. The nitrite ion content was determined by the iodometric back titration of excess permanganate. The phosphate ion content was determined gravimetrically as $Mg_2P_2O_7$.				The $K_3PO_4 \cdot 7H_2O$ was recrystallized. It had a purity of 99.56%.			
				The KNO_2 was synthesized by the reaction of $Ba(NO_2)_2$ with K_2SO_4 . It had a purity of 99.65%.			
ESTIMATED ERROR:							
The temperature was controlled to within $\pm 0.1^\circ C$. The compiler estimates the reproducibility of the solubility values to be about $\pm 0.3\%$.							
REFERENCES:							

COMPONENTS:				ORIGINAL MEASUREMENTS:				
(1) Tripotassium phosphate; K_3PO_4 ; [7778-53-2]				Beremzhanov, B.A.; Voronina, L.V.; Savich, R.F.				
(2) Potassium borate; KBO_2 ; [13709-94-9]				Khim. Khim. Tekhnol. (Alma Ata) 1978, 29-36.				
(3) Water; H_2O ; [7732-18-5]								
VARIABLES:				PREPARED BY:				
Composition at 25°C.				J. Eyseltová				
EXPERIMENTAL VALUES: Solubility in the KBO_2 - K_3PO_4 - H_2O system at 25°C.								
mass% ^a	K_3PO_4		mass% ^a	KBO_2		refr. index	pH	solid _b phase
	mol%	mol/kg ^a		mol%	mol/kg ^a			
----	----	-----	0.368	0.081	0.045	1.441	13.95	A
97.4	77.5	180	-----	-----	-----	1.450	13.80	B
87.6	37.38	33.4	0.054	0.054	0.054	1.445	13.90	C
79.2	24.29	18.0	0.061	0.046	0.036	1.445	13.81	"
72.0	17.53	12.1	0.063	0.035	0.028	1.445	13.48	"
68.4	15.45	10.2	0.117	0.067	0.046	1.444	13.21	"
61.4	11.66	7.5	0.126	0.062	0.040	1.445	12.97	"
57.0	9.77	6.3	0.173	0.079	0.050	1.443	12.88	"
56.4	8.08	6.1	0.176	0.086	0.050	1.441	12.88	A + B
54.6	9.06	5.7	0.171	0.072	0.047	1.440	12.70	A
53.4	8.86	5.4	0.164	0.070	0.044	1.435	12.65	"
47.8	7.07	4.3	0.159	0.061	0.038	1.434	12.50	"
23.4	2.89	1.4	0.187	0.052	0.030	1.430	12.46	"
20.4	2.00	1.2	0.211	0.055	0.033	1.425	12.41	"
10.2	0.79	0.5	0.298	0.069	0.041	1.420	12.35	"
6.6	0.57	0.3	0.328	0.076	0.044	1.410	12.22	"
^a These values were calculated by the compiler.								
^b The solid phases are: A = KBO_2 ; B = K_3PO_4 ; C = $K_3PO_4 \cdot 8H_2O$.								
AUXILIARY INFORMATION								
METHOD/APPARATUS/PROCEDURE:				SOURCE AND PURITY OF MATERIALS:				
The isothermal method was used but no further details are given.				No information is given.				
				ESTIMATED ERROR:				
				No information is given.				
				REFERENCES:				